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IS 482 (1981): Reels for Covered Round Electrical Winding
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**IS : 482 - 1981
(Reaffirmed 1995)**

Indian Standard

**SPECIFICATION FOR
REELS FOR COVERED ROUND
ELECTRICAL WINDING WIRES**

(Third Revision)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard
SPECIFICATION FOR
REELS FOR COVERED ROUND
ELECTRICAL WINDING WIRES
(Third Revision)

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Indian Standard
**SPECIFICATION FOR
 REELS FOR COVERED ROUND
 ELECTRICAL WINDING WIRES**
(Third Revision)

0. F O R E W O R D

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 15 May 1981, after the draft finalized by the Winding Wires Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard was first published in 1953 with the object of reducing the wide range of sizes of reels for covered electrical winding wires.

0.2.1 The first revision was issued in 1962 with a view to giving all the quantities and dimensions in metric system, to incorporate the metric wire sizes in accordance with IS: 1594-1960* which was subsequently withdrawn.

0.2.2 The second revision was issued in 1968 to include moulded plastic reels in the standard and to unify the reference numbers and the important dimensions of the wooden reels and moulded plastic reels to achieve interchangeability.

0.2.3 In this third revision wooden reels of sizes below 160 mm have been withdrawn so that plastic reels which are easy to handle due to lighter weight could be introduced and moulded plastic reels of sizes 315 and 400 mm have been deleted. The flange sizes are taken from R10 series of preferred numbers and they satisfy to a large extent the present practice of flange sizes.

0.3 The design aspects have been given careful consideration in deciding the various dimensions of the reels. One important aspect is that the ratio between the flange and barrel diameter has been kept near about 1.6 : 1 with the object of lessening the variation in the tension and also to facilitate easy unwinding of the wires.

0.4 This standard contains clause 5.1 which calls for agreement between the purchaser and the supplier or permit the purchaser to use his option for selection to suit his requirements.

*Specification for metric sizes of copper wires and conductors for electrical purposes.

0.5 In preparing this standard, assistance has been derived from the following:

BS 1489:1972 Specification for the packaging of covered winding wires for electrical purposes, issued by the British Standards Institution.

DIN 46399-1959 Delivery spools for bare and insulated wires; dimensions issued by Deutscher Normenausschuss.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies the requirements regarding materials, construction, dimensions, tolerances, eccentricity and sizes for reels for covered round wires for winding electrical machinery and apparatus.

2. MATERIALS AND CONSTRUCTION

2.1 The materials used in the construction of the reels shall have the required mechanical strength so that the reels do not warp in actual use or in storage. The material shall have no deleterious effect on the fibres, enamel or other coverings of the wires.

2.2 The flanges and the barrel shall be smooth and free from protruding material capable of damaging the wire or the hands of the winding operator during rotation of the reel. Bolts, screws, nails, etc, if used in the construction of the reel shall be countersunk, so that the heads are below the surface of the flange.

2.3 Wooden reel having a flange diameter of 160 mm shall be varnished and flanges of all wooden reels shall be smoothed.

2.3.1 All wooden components shall be manufactured of seasoned wood preferably softwood. The wood used in the construction shall be sound and free from defects that materially weaken the component parts of the reels. If required by the purchaser, a wood preservative which shall have no deleterious effects on fibres or enamel coverings of wires, be applied to the entire reel.

2.4 Parts of reels made from ferrous metals shall be treated with rust preventive finish or coating to minimize rusting during transit and storage.

*Rules for rounding off numerical values (*revised*).

2.5 All reels shall be provided with recess of adequate depth to accommodate the label.

2.6 In case of plastic reels, the plastic material and reel flanges design (by providing necessary ribs, etc) has to be such that the reel should be able to withstand a breaking stress of minimum 6 MN/m^2 when pulled slowly at a rate of approximately 300 mm/minute after clamping the flanges properly.

2.7 No portion of the plastic reel shall warp when kept in an air-oven at 70°C for one hour.

2.8 The colour of the plastic reel shall be sufficiently stable.

3. DIMENSIONS AND TOLERANCES

3.1 Reel sizes shall always be denoted by the reference numbers shown in Table 1 or 2.

NOTE — Each reference number shall be given as the diameter of flange in millimetres.

3.2 The dimensions and tolerances of the reel shall be in accordance with Table 1 and 2.

3.3 The inner and outer edges of reel flanges shall be rounded to a radius of not less than 1·0 mm for reels up to and including 160 mm in diameter, and not less than 1·5 mm for reels above 160 mm in diameter so as to avoid burrs and sharp corners.

3.4 The bore of the reel shall be coned to an included angle of 60° and shall be as shown in the dimensional drawing.

4. ECCENTRICITY AND FLANGE RUN-OUT

4.1 The unbalance and axial throw of the flanges shall be negligible.

4.2 The eccentricity of the reels when measured in the manner described in Appendix A, shall be not more than the values given in col 20 of Table 1 and col 18 of Table 2.

4.3 The run-out of the inside faces of each flange of reels of 160 mm diameter and smaller, as shown by an indicator gauge, shall nowhere exceed the total tolerance on traverse given in col 6 of Tables 1 and 2.

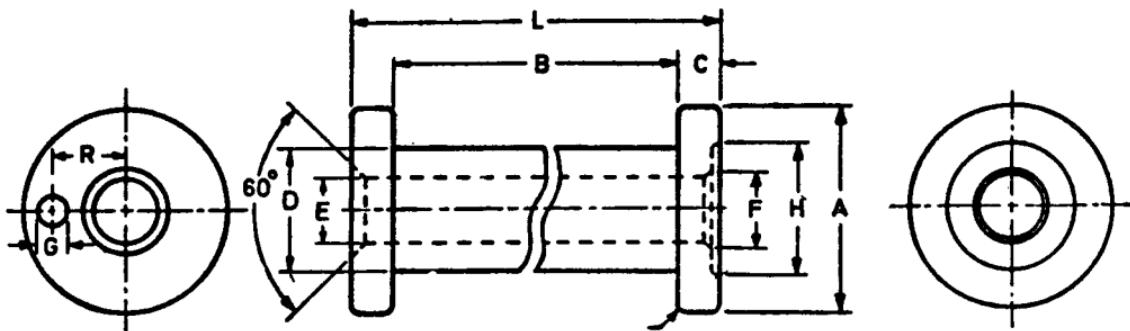
5. SIZES OF WIRES ON REELS

5.1 In order to meet the varying requirements choice of reel is provided. The purchaser shall state the size of the reel required when ordering the wire.

TABLE 1 SIZES AND TOLERANCES OF WOODEN REELS

(*Clauses 3.1, 3.2, 4.2, 4.3 and 6.1*)

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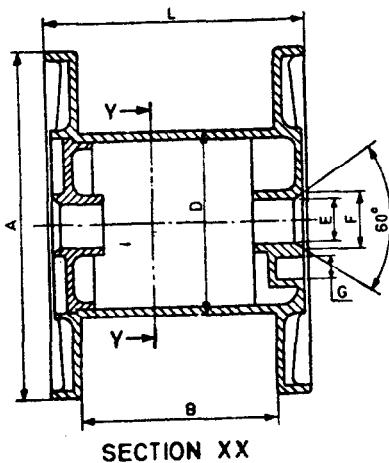
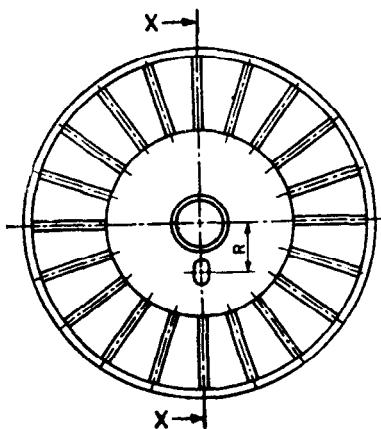
All dimensions in millimetres.

Ref No.	Flange, A		Max Overall length		Traverse, B		Barrel, D		Bore, E		Cone, F		Peg Hole, G		Peg Hole, R		Radius of Rim, r		Label Recess, H		Eccen- tricity	
	Dia	Toler- ance	L	Length	Toler- ance	Dia	Toler- ance	Dia	Toler- ance	Major Dia	Toler- ance	Dia	Toler- ance	Radius	Toler- ance	Dia	Toler- ance	(17)	(18)	(19)	(20)	
160 160	-3·0 +0·0	160	128	+1·0 -0·0	100	±2·0	22	+2·0 -0·0	34	+2·0 -0·0	13	+0·5 -0·0	32	±1·0	4	105	±2·0	1·55				
200 200	-3·0 +0·0	200	160	+1·0 -0·0	125	±2·0	22	+2·0 -0·0	34	+2·0 -0·0	13	+0·5 -0·0	32	+1·0 -0·0	4	105	±2·0	2·0				
250 250	-3·0 +0·0	200	160	+2·0 -0·0	160	±3·0	36	+2·0 -0·0	48	+2·0 -0·0	13	-0·5 -0·0	32	+1·0 -0·0	4	105	±2·0	2·5				
315 315	-3·0 +0·0	200	160	+2·0 -0·0	200	±3·0	36	+2·0 -0·0	48	+2·0 -0·0	13	+0·5 -0·0	32	+1·0 -0·0	4	105	±2·0	3·0				
400 400	-3·0 +0·0	200	160	+2·0 -0·0	200	±3·0	36	+2·0 -0·0	48	+2·0 -0·0	13	+0·5 -0·0	32	+1·0 -0·0	4	105	±2·0	4·0				

TABLE 2 SIZES AND TOLERANCES OF MOULDED PLASTIC REELS

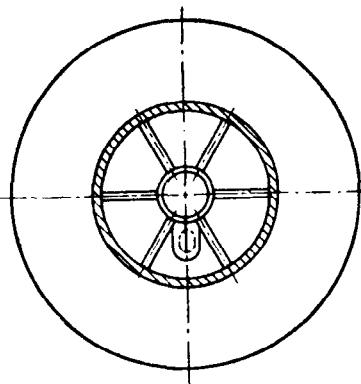
(*Clauses 3.1, 3.2, 4.2, 4.3 and 6.1*)

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SECTION XX

All dimensions in millimetres.



SECTION YY

Ref No.	Flange, A		Max. overall Length L	Traverse, B		Barrel, D		Bore, E		Cone, F		Peg Hole, G		Peg Hole, R		Radius of Rim r	Eccentricity e	Weight of Reel in gm
	Dia	Tolerance		Length	Tolerance	Dia	Tolerance	Dia	Tolerance	Major Dia	Tolerance	Dia	Tolerance	Radius	Tolerance			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
50	50	+1.5 -0.0	50	38	+0.20 -0.00	32	± 0.15	11	+0.1 -0.0	15	+1.0 -0.0	—	—	—	—	1.0	0.25	22
63	63	+1.5 -0.0	63	49	+0.20 -0.00	40	± 0.15	11	+0.1 -0.0	15	+1.0 -0.0	—	—	—	—	1.5	0.25	40
80	80	+1.5 -0.0	80	64	+0.20 -0.00	50	± 0.15	16	+0.2 -0.0	24	+1.0 -0.0	7	+0.25 -0.00	20	± 0.5	2.0	0.25	70
100	100	+1.5 -0.0	100	80	+0.20 -0.00	63	± 0.15	16	+0.2 -0.0	24	+1.0 -0.0	7	+0.25 -0.00	20	± 0.5	3.0	0.25	125
120	125	+1.5 -0.0	125	100	+0.20 -0.00	80	± 1.5	16	+0.2 -0.0	24	+1 -0	7	+0.25 -0.00	20	± 0.5	3.0	0.35	200
160	160	+1.5 -0.0	160	128	+0.20 -0.00	100	± 1.5	22	+0.2 -0.0	34	+1 -0	13	+0.50 -0.00	32	± 0.5	3.0	0.45	350
200	200	+2.0 -0.0	200	160	+0.20 -0.00	125	± 1.5	22	+0.2 -0.0	34	+1 -0	13	+0.50 -0.00	32	± 0.5	4.0	0.75	600
250	250	+3.0 -0.0	200	160	+0.20 -0.00	160	± 2.0	36	+0.5 -0.2	49	+1 -0	13	+0.50 -0.00	32	± 0.5	5.0	1.00	1050

NOTE—The weights given under column 19 are for 'Polystyrene' bobbins, only as an approximate guide to manufacturers. For bobbins other than 'Polystyrene', the weights specified will change according to the specific gravity of the plastic material used for making.

6. MARKING

6.1 The reference number given in col 1 of Table 1 or 2 shall appear either on the flange or on the barrel of each reel.

6.1.1 The reels may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

APPENDIX A

(*Clause 4.2*)

MEASUREMENT OF ECCENTRICITY AND FLANGE RUN-OUT

A-1. REELS OF 160 mm DIAMETER AND SMALLER

A-1.1 The reels shall be placed horizontally between centres of 60° included angle on a 16 mm diameter shaft (see Fig. 1), and shall be rotated slowly. The eccentricity shall be measured by a suitable indicator dial gauge *A*, placed in contact with the external surface of the barrel. The eccentricity of the reel is equivalent to half the measurement shown by the gauge. The run-out of the inside faces of the flange is shown by the appropriate indicator gauge *B*.

A-2. REELS OF 200 mm DIAMETER AND LARGER

A-2.1 The reels shall be placed on a horizontal 35 mm spindle, and shall be rotated slowly (see Fig. 2). The eccentricity shall be measured by a suitable indicator dial gauge *C* in contact with the external surface of the barrel. The eccentricity of the reel is equivalent to half the measurement shown by the gauge.

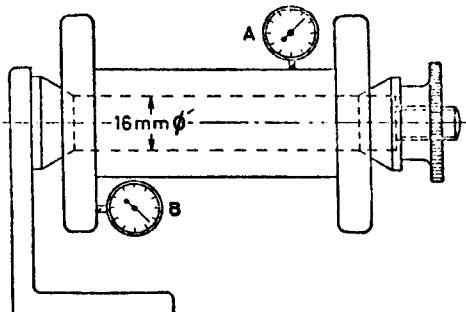


FIG. 1 MEASUREMENT OF ECCENTRICITY AND FLANGE RUN-OUT ON REELS 160 mm DIA AND SMALLER

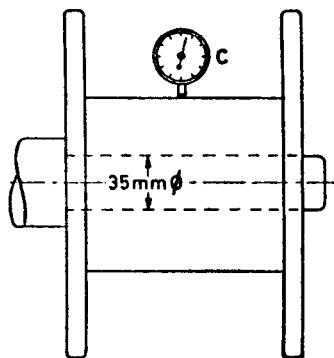


FIG. 2 MEASUREMENT OF ECCENTRICITY REELS 200 mm DIA AND LARGER

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